tungsten was responsible for the observations that had led Koblic into his statement. He admitted his error and withdrew his claims.[2] The Noddacks deserve the gratitude of the scientific world for the decisive manner in which they proved the falsity of these claims.[3]

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SCIENTIFIC BOOKS

A HISTORY OF FRENCH SCIENTIFIC SOCIETIES

Scientific Organizations in Seventeenth Century France (1620–1680). By HARCOURT BROWN. xxii + 306 pp. History of Science Society Publications, No. 5. Baltimore: The Williams and Wilkins Company, 1934. Price $3.00.

THIS is primarily a history of the scientific societies, that is, of private assemblies of the amateurs of the natural sciences rather than of the Académie Française and the Académie des Sciences in the seventeenth century in France. These constituted a succession of associations, clubs, conferences and assemblies long known but whose influence and meaning has hitherto been unanalyzed. From them came a multitude of essays and publications forming the bulk of the popular scientific literature of their day. Their history lies in the archives and manuscripts of Western Europe, often in other countries than France. They are the heirs of the Platonic tradition of free assembly and corporate activity outside of political control or governmental origination and support. To the tradition of the academy, museum and lyceum of the philosophic schools of classic period they added cooperation in the practical arts. This appears in an active interest in discoveries and inventions, the provision of a place for the trial of new methods, for experimentation, for the accumulation of the comforts and conveniences of life and sometimes for the secrets of the practitioners of the arts from astrology to ship-building. They thus avoided some of the opposition which the greater and more intellectually powerful academies were arousing in royalty, the church and in organized medicine, such as Dr. Henry Stubbs' assaults on the Royal Society of London, inspired and perhaps paid for by Dr. Harvey, patron of the College of Physicians. The membership of these minor societies in France not infrequently exercised their freedom in criticism of their compatriots in the more august academies. Under their fostering care they gave a widened diffusion to the sciences and the arts, stimulated thought, inspired criticism and contributed to the progress of the standards of living and culture between the Renaissance and the Encyclopedia of Diderot. The turmoil of war after 1680 interrupted their contacts abroad, restricted their activities at home and effectually obliterated their further influence.

The impetus to the interest in science originated in the skepticism of Montaigne, but the organization followed Italian models and gained power through the prestige of the city of Paris. The chief link with Italy was Peiresc (1580–1647), a student at Padua, a traveled scholar and patron of the arts. He had five telescopes, collected plants, fossils and crystals, carried on dissections, discovering the chyle ducts, distrusted astrology; was a patron of letters, but his discoveries remained in manuscript.

The brothers Dupuy, historians, librarians and lovers of books, were the founders of the Cabinet Dupuy. Its library, the Fonds Dupuy, is now in the Bibliothèque Nationale. This cabinet was the center of free discussion of the intelligentsia of France. Its members sought in its meetings intelligent and authoritative reports of the world at large. It established the tradition for the patrons of learning later followed by Ménage, Justel and others.

The weekly pamphlets published (1633–1642) by Renaudot, and reported as *Conférences du Bureau d'Addresse,* originated in a popular enterprise combining the features of a pawnshop, auction house, free clinic and information bureau. This is reported to be the first serial of scientific nature; though scoffed at and criticized by the learned professions, it nevertheless afforded a free medium of information and a form for the discussion of current ideas. The serial was translated and published in London in 1664–1665 in an obvious response to the public interest in the newly founded Royal Society and stimulated the opening of the Office of Intelligence in London in 1638. The hostility of the medical profession caused the legal suppression of the enterprise in Paris in 1644.

The Renaudot enterprise forwarded the decline of Latin as the medium of scientific publication in favor of the modern languages. Mersenne, the Huguenot monk, also forwarded this with his extensive correspondence, his conferences of physicists and mathematicians, and his liaison relationships between the more conservative forces of his time and the devotees of the new sciences. His Europe-wide relations, his liberalism and his rationalism did much to develop and maintain the freedom of discussion in his day, even though his cautious circumspection at times clothed the replies to his penetrating questions with a

[2] *Chemiker Zeitung,* August 22, 1934, page 683.

[3] Translated by Ralph E. Oesper, University of Cincinnati.

mass of protective verbiage. Mersenne was a correspondent of Haak, an associate of Pell, Comenius, Ward, Digby, Cavendish and Hartlib in London, a relationship influential in the founding of the Royal Society of London, an influence heightened by his controversy with and antagonism to the medievalist, Fludd.

To the Montmor Academy has been attributed a dominant influence in the foundation of the Royal Society of London. This our author contests, though admitting that Oldenburg had once attended one of its meetings. He marshals evidence, on the other hand, that the Royal Society was influential in inspiring this French organization to propose a government-sanctioned academy at Paris. But when Colbert did establish the Académie des Sciences he omitted many of the contentious members of the Montmor group and selected the membership on narrower lines than the London group, cautiously avoiding the opposition of the Jesuits, the medical profession and other vested rights in intellectual leadership.

The closing chapters deal with the conferences of Henry Justel, the origin and growth of scientific publications and the relations of science to the press. This scholarly treatise is replete with data concerning this most significant period in the emergence of modern science, and its critical analysis of these wider influences tributary to its growth is a welcome addition to the history of science.

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THEORETICAL PHYSICS

Introduction to Theoretical Physics. By J. C. SLATER and N. H. FRANK, McGraw-Hill Book Company, pp. xx, 576, $5.00, 1933.

IN this notable work Professors Slater and Frank, of the Massachusetts Institute of Technology, offer a text of intermediate grade which carries the reader through classical physics far into the intricacies of the wave mechanics. The first 328 pages are devoted to classical physics and the remaining 248 pages to quantum theory. As might be expected, the authors lay greatest stress on those problems of classical physics which exhibit the mathematical methods which are employed later on in the development of wave mechanics. Thus the theory of coupled oscillators, the vibrations of a string with variable tension and density, the vibrations of membranes and the like are treated in considerable detail. The authors are to be congratulated on the clearness and perspicuity of their development of the subject, and on the excellent exposition of even the more difficult portions of quantum theory which they have made available to the student whose mathematical equipment is limited to the elements of differential and integral calculus. In the part of the book devoted to wave mechanics they take up in addition to the theory of hydrogen-like atoms such topics as perturbation theory, many-electron atoms, interatomic and molecular forces, quantum statistics, molecular structure, collisions and chemical reactions, electronic interactions, electron spin, Fermi statistics and metallic structure, and the quantum theory of dispersion. The book is divided into a large number of short chapters each of which contains one or two closely related subjects; an excellent arrangement from the pedagogical view. At the end of each chapter is a collection of relevant problems, which provide the student with an excellent test of his understanding of the textual material. The most notable omissions in the text are the relativity theory and the electromagnetic theory of mass. The special relativity has played such an important part in modern physics that at least the development and interpretation of the Lorentz transformations might be expected to be found in a work of this grade. On the other hand, theoretical physics has become such an extensive subject that no author can attempt to cover all its important aspects in the compass of a single volume.

Particularly as regards the first part of the book, it seems to the reviewer that "Mathematical Methods in Physics" would describe the contents better than the title chosen by the authors. For the emphasis is rather on the analytical methods suitable for the solution of physical problems than on the logical development of physical theory. In many cases the authors utilize examples from various branches of physics to illustrate the analytical procedure under discussion, rather than subordinating the mathematical process of solution to the continuity of development of the physical theory. On the other hand, the authors are too prone to omit the proof of an important physical result in order to avoid analytical details. This procedure is not always satisfactory to the intelligent student, who is often as interested in the reasoning by which the result has been established as in its significance and interpretation.

There are few statements in the text to which the teacher can take exception. The one which is likely to create the most unpleasant reaction is the reference on page 16 to the back e.m.f. of resistance.

Altogether the book is a notable contribution to the increasing number of texts in intermediate physics, and unique in its masterly presentation of quantum mechanics. It will be of inestimable service in introducing the student to this most important branch of physical science.

LEIGH PAGE

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